UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION II
JACOB K. JAVITS FEDERAL BUILDING
NEW YORK, NEW YORK 10278

MAY 11 1990

CERTIFIED MAIL
RETURN RECEIPT REQUESTED

Donald J. Murphy
Facility Coordinator
SCP Carlstadt Site
Langan Environmental Services, Inc.
River Drive Center 2
Elmwood Park, NJ 07407

Re: SCP Carlstadt Site

Dear Mr. Murphy:

The U.S. Environmental Protection Agency ("EPA") has reviewed your submittal entitled SCP Carlstadt, Interim Remedy: Preliminary Design Report, dated April 20, 1990, prepared by Langan Environmental Services, Inc. ("the Report").

This Report advocates, among other items, that a "simple temporary cap" be installed over the Site to "prevent rainwater infiltration". This cap is to be installed as part of an interim remedy for the Site the first operable unit ("FOU") at the Site.

EPA recognizes that installing a "simple temporary cap" (as referred to on page 1. of the Report) may be a desirable component of an interim remedy at the Site. This is due largely to the fact that a temporary cap appears to provide a reduction in costs as compared to pumping and treating precipitation which might otherwise enter the FOU if some type of barrier was not installed. However, a temporary barrier would merely reduce the amount of precipitation entering the Site for a short period of time and would not eliminate any risks posed by conditions at the Site nor would it provide the level of protection and permanence required for final remediation of the Site by law. The Agency, therefore, disagrees with some assertions and implications which are contained in this Report which imply otherwise.

Although a temporary cap may be a desirable component of some interim remedy for the Site, any cap which might be selected for that interim remedy must not in any way obstruct either data collection or implementation of a permanent remedial action for soils/sludges and debris within the FOU. EPA believes that the cap design proposed in the Report will impede sample collection and future remedial action. Therefore, the Agency declines to accept the design described in the Report. If and when a temporary cap is selected as part of any interim remedy for the Site, its design can be developed after a Record of Decision identifies it as an appropriate measure for installation at the Site.

This letter addresses only those major issues which EPA believes warrant Agency comment and as such, is not intended to imply that the Agency endorses any of the views stated or implied elsewhere in the Report.

Sincerely yours,

Janet Feldstein

for Raymond Basso, Chief
New Jersey Compliance Branch

cc: William Warren
    Pamela Lange, NJDEP

Elmwood Park NJ
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Langan
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New York, NY 10121
(212) 432-7685

20 April 1990

Mr. Raymond Basso
Chief, New Jersey Compliance Branch
USEPA Region II
26 Federal Plaza
New York, New York 10278

Re: SCP Carlstadt Site, Administrative Order,
Index No. II-CERCLA-50114

Dear Mr. Basso:

In accordance with your recent written requests and based on my conversations with Ms. Janet Feldstein, the Cooperating PRPs have prepared the enclosed draft "SCP Carlstadt - Interim Remedy: Preliminary Design Report" (nine copies enclosed).

As you will note, it covers site preparation, slurry wall construction, dewatering, treatment and disposal of groundwater, installation of a temporary cap (at the insistence of the Cooperating PRPs as a means of controlling rainwater infiltration and thus precluding the unnecessary expenditure of excess funds on groundwater collection and treatment) and monitoring.

On behalf of the Cooperating PRPs, I would be pleased to meet with you, your staff, and your consultants to discuss the preliminary design of the Agency's proposed Interim Remedy.

If you have any questions, please call.

Langan Environmental Services, Inc.

Facility Coordinator

Donald J Murphy

Donald J. Murphy, P.E.
President

DJM:mg
Enclosure

cc: Pam Lange, NJDEP (w/3 enclosures)

002958

SCP CARLSTADT

INTERIM REMEDY: PRELIMINARY DESIGN REPORT
20 April 1990

INTRODUCTION

This report presents the preliminary design basis and estimated costs for the various components of the First Operable Unit (FOU) interim remedy for the SCP Carlstadt site. As proposed by the USEPA on 28 February 1990, the interim remedy is to consist of installing a slurry cutoff wall around the site to isolate the FOU, and dewatering the FOU to prevent migration of contaminants from the FOU to deeper aquifers and offsite. The FOU has previously been defined by the USEPA as the physical property boundaries of the 5.9 acre site and the associated soil/sludge/rubble and ground water down to, but not including, the underlying silt/clay layer.

This preliminary design incorporates the components necessary to achieve the objective of isolating the FOU in a cost-effective manner. The major components of the interim remedy as proposed by EPA include construction of a slurry wall, dewatering, and either on-site or off-site treatment/disposal of the FOU ground water that is removed. To limit the amount of water that must be removed and treated, the Cooperating PRPs added to the remedy a simple temporary cap to prevent rainwater infiltration. A schematic plan view of the interim remedy is shown on Figure 1. Cross-sections through the FOU are shown on Figures 2 and 3. Each component of the interim remedy is discussed in the following sections.

SITE PREPARATION

Mobilization/demobilization

Mobilization will include the contractor's efforts in transporting equipment, materials and personnel to the site, and setting up temporary field facilities such as office trailers, decontamination facilities, storage areas, and utility hook-ups. Demobilization will include the contractor's efforts in dismantling and decontaminating the field facilities and transporting them as well as his equipment and personnel from the site.

Fencing

The existing fence will have to be removed to allow free access to a corridor along the site perimeter where the slurry wall will be installed. Although the existing fence is serviceable as is, it is likely that none of it will be salvageable for re-use because of its age and patchwork construction. A new fence will have to be installed outside the limits of the slurry wall prior to slurry wall construction. Subsequently, that new fence will have to be relocated to the proper setback requirements. While there is presently no fence at the site along Peach Island Creek, it is assumed that a fence will be installed along the creek for site security both during and after construction. Furthermore, while a fence does exist between the site and Carolina Freight Carriers Corporation, it is likely that a new fence will be installed there as well.

Perimeter Road

A perimeter road along the slurry wall alignment will be necessary to support the heavy construction equipment that will be used to install the slurry wall and to protect the wall from construction traffic.

Sheetpiling Along Creek

The FOU extends to the bank of Peach Island Creek. Though it would not be practical to construct a slurry wall right at the edge of the creek, the slurry wall should be as close to the creek as possible to minimize the amount of FOU material excluded from the interim remedy. To accomplish this, it will be necessary to install a steel sheetpile wall between the creek and the location planned for the slurry wall prior to slurry wall construction, as shown on Figure 3. The sheetpile wall will be designed to prevent bank failure due to equipment loads and vibrations.

ISOLATION WALL

Types Of Walls Considered

A cut-off wall along the site perimeter will be required to hydraulically isolate the FOU from surrounding ground water during dewatering, and to maintain the FOU in a dewatered state thereafter. Three types of cut-off walls were presented in the FS/FOU: a soil/bentonite slurry wall, a soil/bentonite slurry wall with flexible membrane liners inserted into the wall during construction, and a reinforced concrete wall constructed in a slurry trench. The type of permanent remedy considered in the FS for the FOU dictated the type of wall.

In applications where a cut-off wall would be needed only to facilitate temporary dewatering, a soil/bentonite wall would be sufficient. In applications where cut off and containment of longer duration is needed, an "upgraded" wall with membrane inserts (e.g., high-density polyethylene, or HDPE) would be appropriate. A third type of wall, a reinforced concrete wall constructed in a slurry trench, often is thought to be appropriate for applications where excavation is required but long-term cut-off/containment is not critical. In such cases, a reinforced concrete wall would allow temporary dewatering and would provide structural support during excavation. However, concrete is relatively porous compared to soil/bentonite, and usually cracks slightly due to shrinkage and due to stresses induced during excavation. Thus, a concrete wall would not be as effective as a soil/bentonite wall for other than very short term water cut-off.

The Wall Selected

The interim remedy must include a wall that will not preclude any final remedy. None of the three walls as described in the foregoing fully meets this criterion. The ideal wall should provide both permanent hydraulic isolation of the FOU and temporary structural support for any possible future scenario.

A method to achieve this dual goal is to install the upgraded slurry wall (using a single membrane) for the interim remedy, and to provide structural support later, if necessary for the final remedy. Sheetpiling could be installed through the slurry wall to provide structural support. It is possible that the membrane within the slurry wall would be damaged slightly during sheetpile installation, but at that time the isolation benefits of an upgraded slurry wall might not be needed. If "upgraded" containment (i.e., slurry wall with membrane) were still necessary as part of the final remedy, the sheetpiling could be installed along the inside face (site side) of the slurry wall to avoid damaging the membrane.

It should be noted that this alternative includes only a single membrane within the slurry wall (see Figure 2) as opposed to the double membrane considered in the FS/FOU. This modification is based on the July 1989 test pit work at the site, the results of which indicate that as much as 60 percent of the FOU material is rubble/debris. As envisioned in the FS/FOU, the slurry trench would be lined on both sides by membranes, and the trench would be backfilled with a soil/bentonite mixture. This backfill would push the membranes against the trench sidewalls, where protruding rubble/debris may puncture the membranes, thereby reducing their effectiveness. It was assumed in the FS/FOU that up to 4 percent of the membrane surfaces would be punctured by rubble/debris, yielding 0.64 gallons per day of inflow through the wall. The solution used herein is to use a single, thicker membrane (e.g., 60 mil) installed in the center of the slurry trench (to protect the membrane), with soil/bentonite backfill placed on both sides. Inflow through this wall will be negligible to non-existent. The cost for this wall will be roughly the same as for a double membrane wall because the savings in membrane costs will be offset by the additional effort required to center the single membrane.

OTHER CONSTRUCTION DETAILS

Respread Excavation Material

The soil/rubble/debris excavated from the slurry trench will be unsuitable for re-use as backfill within the trench. Thus, it will be spread on site, and imported soil will be mixed with bentonite to construct the slurry wall. The estimated volume of 5,000 cubic yards is based on a 3-foot wide trench, 15 feet deep, with a 25 percent increase due to rubble obstacles and to sloughing of the trench sidewalls during excavation. The Land Disposal Restrictions do not apply in this case because the material is not being treated but is being consolidated in the area of contamination (the site).

VOC Control

The material to be excavated from the slurry trench and to be spread on site probably contains levels of volatile organic compounds (VOCs) sufficient to warrant the use of control methods. Though the bentonite slurry within the trench and mixed with the excavated material will provide some degree of vapor suppression, it may be necessary to apply foam to control VOC emissions adequately. An allowance has been made for this in the cost estimate.

INSTALLATION OF A TEMPORARY CAP

Justification

In the absence of a cap, approximately 11,300,000 gallons of rainwater would percolate into the FOU over the assumed three-year lifetime (per EPA) of the interim remedy. This estimate is based on the following calculations:

- the average rainfall for the last 3 years was 47.7 inches/year
- the average evaporation for the last 3 years was 24.2 inches/year
- the runoff will be essentially zero
- the net percolation will be 23.5 inches/year
- over 5.9 acres this is 3,760,000 gallons/year
- assuming that the interim remedy will be in place for 3 years, the estimated incremental cost of pumping the rainwater is $400,000. The estimated incremental cost of treating and disposing of this water is $2,500,000 for onsite treatment (excluding capital costs of $1,700,000 which would not be considered incremental) and $3,000,000 for offsite (at Du Pont). The estimated cost of a temporary cap is $560,000.

Furthermore, a temporary cap will immediately break a direct contact pathway and will preclude wind-borne transport of contaminated dust particles during the three years that the interim remedy will be in place.

Clearing

As part of the site preparation for installing a temporary cap, vegetative matter will be cleared from the site and disposed off-site, probably at the HMDC landfill. Roots will not be grubbed (pulled) because the roots must be considered contaminated by virtue of being in direct contact with contaminated soil.

Grading

For normal synthetic membrane installation, a cushion layer of sand is placed over a site to prevent puncture of the cap by underlying material. A 6-inch sand layer is typical for a cushion, but at SCP Carlstadt this would add approximately 5,000 cubic yards to the FOU for remediation since it would not be practical to segregate this sand from the FOU material. It would be cost-effective to eliminate the need for this sand cushion layer by fine-grading the surface of the site and removing sharp protrusions. Removed material would be stockpiled above the cap and covered with a tarp. The existing rubble/debris piles also would be stockpiled above the cap.

Geotextile Cushion Layer

In addition to protecting the membrane by means of the grading described above, a geotextile would be incorporated into the design to assure additional membrane protection. The combined cost of grading/geotextile would be about the same as the cost of the sand cushion layer, but no additional FOU soils will be created and thus the unnecessary expenditure involved with remediating the 6 inch soil cushion would be precluded.

Membrane Cap

The slurry wall around the site will cut off ground water recharge into the FOU during and after dewatering. With the membrane in the slurry wall, inflow through the wall will be negligible to non-existent. However, rainfall infiltration from the surface could occur. This recharge would have to be removed periodically to maintain the FOU in a dewatered state. Removal, treatment and disposal of this percolating rainwater could cost several million dollars. Thus, it would be cost-effective to preclude this rainfall recharge by capping the site temporarily with a synthetic membrane (e.g., HDPE) rather than pumping/treating rainfall infiltration. This is especially significant as it is likely that the final remedy will be at least three years removed from the interim remedy.

A more important benefit of temporarily capping the site is that the pathway of direct contact with surface soil at the site would be broken for the duration of the interim remedy.

When the FOU is dewatered, it is possible that VOCs could volatilize in the unsaturated FOU material and collect beneath the cap. Consequently, vents will have to be installed through the membrane to preclude the possible accumulation of vapors beneath the cap.

In the FS/FOU, it was estimated that a maximum of 0.14 gallons of water per day could infiltrate through a double-membrane cap. If this quantity of infiltration is doubled for a single-membrane cap, then it is estimated that no more than 300 gallons of water could infiltrate into the dewatered FOU during the assumed 3-year duration of the interim remedy. This volume of water is insignificant.

Cover

A soil cover will be placed on the synthetic membrane to protect the membrane from physical damage and to prevent degradation of the membrane caused by prolonged exposure to ultraviolet radiation from sunlight.

Perimeter Erosion Control

Erosion control will consist of silt fences, hay bales and straw mulch designed to minimize the loss of cover and temporary roadway material onto off-site properties and into Peach Island Creek.

DEWATERING

Method

In the absence of recharge into the FOU, dewatering will be essentially a one-time event. A satisfactory way to begin dewatering would be to pump from the existing shallow monitoring well network on site. Although complete dewatering of the FOU down to the top of the silt/clay layer cannot be accomplished by this method (about a foot of water may remain), this method would remove all of the water that can be practically removed. The water would be collected in an on-site holding tank, which would be routinely emptied by transferring the water into onsite treatment facilities or to tankers for off-site disposal (discussed later). It is estimated that from six to twelve months of dewatering will be necessary to remove most of the FOU water. The existing shallow well network may have to be supplemented by additional wells, but this cannot be evaluated until initial dewatering occurs. The cost of additional wells, if needed, would be relatively low and was assumed to be included in the dewatering estimate.

Volume

The volume of water that can be removed from the FOU is estimated to range from 500,000 gallons to 1,000,000 gallons. This range is substantially less than the 3,000,000 gallon estimated in the FS/FOU, which considered a 12-foot depth of the FOU, a water level two feet below grade, a typical porosity (void space between soil particles) of 30 percent, and 50 percent maximum practical removal of the total volume of water. The less conservative assessment used for this preliminary design assumed that neither the gray silt nor the peat (each about two feet thick on average) could be effectively dewatered. With the ground water table at a depth of two feet and a residual water column one foot high above the peat, the thickness of the saturated FOU for dewatering purposes is five feet (versus the ten feet used in the FS/FOU). The porosity of the FOU is expected to be less than the typical value for soil because the actual void space within the individual pieces of rubble is generally less than in an equivalent volume of soil. For example, the steel I-beam in the FOU would have a porosity approaching zero. By assuming a porosity of 10 percent for the rubble (60 percent of the FOU volume) and 30 percent for the soil (40 percent of the FOU volume), the weighted average porosity for the FOU is 18 percent. With consideration given to residual soil moisture after dewatering, the estimated volume of FOU water which can be removed is 500,000 to 1,000,000 gallons. The high end of the range was used for cost estimating purposes.

Loading

For the case of offsite disposal, it was assumed that loading of 5,000-gallon tankers will take 2 hours per tanker. An estimated total of 200 tanker trips will be necessary.

Transportation

For the case of offsite disposal, transportation by tanker trucks to Du Pont's Chambers Works treatment facility in Deepwater, New Jersey was included in the estimate.

TREATMENT OF GROUNDWATER

General

During the initial development of this preliminary design of the interim remedy, several options for groundwater treatment and disposal were considered. These included onsite treatment and disposal at the local POTW, onsite treatment and disposal in Peach Island Creek, and offsite treatment and disposal.

Onsite Treatment/POTW Disposal Option

With respect to the POTW option, the Bergen County Utility Authority (BCUA) has indicated that it has imposed a moratorium on accepting ground water, although it has accepted petroleum hydrocarbon-contaminated water from two gas station cleanups. That notwithstanding, BCUA stated that it does not accept VOC-contaminated ground water. BCUA has recently proposed minimum VOC levels to NJDEP. These proposed VOC levels, as well as BCUA's limits for metals and other parameters, are shown on Table 2. Also included on Table 2 are the average concentrations for the corresponding parameters in the FOU water. BCUA will not consider accepting FOU water unless a formal application is made. However, considering the ground water moratorium, and the fact that many of the constituents in the FOU water are not covered under BCUA's influent limitations, this is not a viable alternative.

Onsite Treatment/Peach Island Creek Disposal Option

Regarding onsite treatment and disposal to Peach Island Creek, NJDEP just recently provided EPA with discharge limitations. These are being reviewed with respect to whether or not they are achievable by means of Alternative GW-6 (steam stripping) as described in the FS/FOU. The initial results of this evaluation are discussed in the following paragraphs. A parallel evaluation involving a comparison with Berry's Creek NJPDES information and other water quality data is ongoing.

Estimated Compliance With Effluent Limits - The organics removal process (steam stripping) to be employed as the main part of Alternative GW-6 cannot alone achieve compliance with the effluent limits. Based on information provided by Peroxidation Systems, Inc., on the UV/peroxidation polishing process included in this alternative, it appears that GW-6 can comply with the limits to the extent of present information. The compounds for which adequate data are available from the treatability testing are all expected to be removable to the desired effluent limits.

It should be noted that Alternative GW-6 as discussed in the FS/FOU included chemical precipitation. The addition of stringent limits for metals to the discharge criteria makes a highly efficient chemical precipitation process necessary if compliance with these limits is to be even attempted. As no formal treatability studies were completed on chemical precipitation for metals removal or on biological toxicity studies of the ground water to be treated, there are no data to use to evaluate if the criteria for these parameters set forth by NJDEP for direct discharge can be met.

Aside from these uncertainties, it is expected that Alternative GW-6 will likely be able to meet the discharge criteria. It is likely that the organics can be adequately removed by the processes proposed, given their similarity to other compounds that were sufficiently removed during the treatability testing. Because of the extremely low metals effluent criteria proposed, the efficacy of chemical precipitation may be impeded by the solubility limits of the metals in solution. It would be logical to employ a chemical precipitation process for metals removal as well as solids settling. The settling solids could act to sweep some metals from solution and serve as precipitation sites for others.

Cost Estimates - A system sized for a flow of 50 GPM was discussed in the FS/FOU. A system of this size would have the capacity to treat more than 1 million gallons if the situation required, and/or allow recycling of the wastewater for additional treatment if necessary.

The cost of purchasing a GW-6 treatment system is less than the rental price (refer to Appendix K of the FS/FOU), since vendors normally do not rent this type of equipment, and they intend to recover all costs in the rental price over the duration of the treatment. An additional $100,000 should be added to the Appendix K total direct construction cost to allow for the installation of a more efficient chemical precipitation process for metals removal. A summary of estimated costs without engineering/administration costs, any additional bench tests, possible pilot scale tests or contingency follows:

Alternative GW-6 treating 1 million gallons		
Capital Cost	$1,706,000	(including 10% for startup costs)
O & M Cost	$ 220,000	(for 8 months, assuming one operator)
Total	$1,926,000	

Offsite Treatment/Disposal Option

Off-site treatment/disposal would preclude the need to resolve effluent discharge issues and render concern with achievability academic. While originally considered in the FS/FOU, off-site treatment/disposal was screened out in Section 2 of the FS/FOU. The reasons for elimination were: inherent transportation hazards, pretreatment requirements and relatively high costs. The elimination of this option may have been premature. Based on LESI's recent discussions with off-site TSD operators, particularly Du Pont and Rollins, pretreatment would not be required. Du Pont has indicated that it can accept the FOU water without pretreatment at it's minimum charge of $0.13/gallon, subject to a regulatory determination that the contaminated ground water is not TSCA-regulated. In response to LESI's recent inquiry, USEPA Region II has indicated that the FOU water would not be TSCA-regulated unless it contains either PCB concentrations greater than 50 ppm or a separate phase liquid with PCB concentrations of the separate phase greater than 50 ppm. In this latter case, the separate phase as well as the water in contact with it (e.g., in a tank truck) would be TSCA-regulated and must go to a TSCA-permitted TSDF (such as the Rollins incinerator in Texas). The maximum concentration of PCB found in the FOU water was 17 ppm, so it is unlikely that much, if any, TSCA-regulated water exists on site. For cost estimating purposes, it was assumed that there is no TSCA water at the site.

A recent letter from Du Pont regarding the impact of Land Disposal Restrictions on it's commercial operations is included in the Appendix. The key paragraph is on page 2 of the letter:

"In addition to proposing the form of the standards, EPA also proposes to grant an extension of the effective date of the standards, to ensure that adequate treatment capacity of the appropriate type is available for the wastes. EPA has proposed granting a two-year extension of the May 8, 1990 deadline banning land disposal of solid and sludge residuals from treatment of leachate/groundwater. If this extension is granted in the final rule, Chambers Works will be able to continue to accept and treat hazardous waste leachates and contaminated groundwater. If the extension is not adopted in the final rule, we will not be able to accept these wastes from May 9, 1990 until approximately mid-1992."

For the purpose of evaluating off-site treatment in this preliminary design of the interim remedy, it was assumed that the two year extension will be granted. This assumption will be re-evaluated, if necessary, after the 8 May 1990 rule-making deadline.

Comparison Of Onsite And Offsite

Off-site treatment will be substantially more cost-effective than on-site treatment. Without any markups for contingency etc., the combined loading, transportation and off-site treatment at Du Pont estimated cost is $264,000 for 1,000,000 gallons, versus $1,926,000 for on-site treatment via GW-6. Even if it were assumed for comparison purposes that Du Pont could not accept the FOU water and that it would have to go to Rollins in Bridgeport, New Jersey for incineration, then the treatment costs would be $1.25/gallon, or $1,250,000 for the volume under consideration. Transportation costs would be the same, as the Rollins facility is not far from the Du Pont facility. The combined loading, transportation and off-site treatment estimated cost for the Rollins option is $1,400,000 without any markups. This estimated cost is still lower than the GW-6 cost of $1,926,000.

One factor not included in the preceding comparisons is the eventual capital cost for a long-term treatment system for till and/or bedrock aquifer water. While GW-6 could be used for this, a simpler system would be appropriate because water from the deeper aquifers is substantially "cleaner" than the FOU water. Volatile organic compounds are the primary concern in these deeper aquifers. A separate and simpler treatment system such as an air stripper would be more efficient in the long term for treating water from these aquifers. Consequently, the cost for treating water outside the FOU was not considered when comparing options.

Based on the evaluations presented in the foregoing, off-site treatment of FOU water at Du Pont should be included as the ground water component of the interim remedy.

OTHER ITEMS ASSOCIATED WITH IMPLEMENTATION

Site Security

The fence around the site will serve as the primary security measure. However, during the estimated 6-month construction phase, additional security by means of security guards is recommended and has been provided for in the cost estimate.

Engineering And Construction Oversight

Engineering will include final design, preparation of specifications and bid packages, meetings with the USEPA to explain/finalize details of the interim remedy, evaluation of contractor bids, and negotiations with the selected contractor. Compatibility testing of the slurry mix with site contaminants would be evaluated, and soil borings would be drilled along the slurry wall alignment to confirm the silt/clay layer thickness. It is assumed that construction oversight will be needed for an estimated six-month construction phase.

Monitoring

Monitoring will be necessary to evaluate the effectiveness of the interim remedy. Monitoring should consist of periodically measuring water levels in wells on site as well as off site. Seven monitoring wells and 14 piezometers exist on site in the FOU. Five monitoring wells exist off site in the shallow aquifer. The combined 26 monitoring locations would provide sufficient water level data for evaluating the interim remedy's primary goal of achieving and maintaining a dewatered FOU.

The deeper aquifers should be monitored as a means of providing additional data concerning the effectiveness of the interim remedy. Quarterly sampling and analysis of the till and bedrock aquifers is recommended until a final remedy is selected, designed, and implemented. The wells to be sampled initially should include the three on-site till wells and the one on-site bedrock well, since these are directly below the FOU and will be the first wells to show any change in water quality. This monitoring network can later be expanded to include off-site till and bedrock wells, if necessary. The samples should be analyzed for VOCs and PCBs. The selection of VOCs as indicator chemicals is obvious as several VOCs were detected in the till aquifer at concentrations in the tens of ppm range. The selection of PCBs is based on the one detection of Aroclor 1232 (1.8 ppb) in the till aquifer. The three B/N/A compounds detected in the till aquifer were all at low ppb concentrations, as were copper, zinc and petroleum hydrocarbons (see RI Report, Tables 21 and 22). Consequently, these compounds need not be evaluated unless/until VOC concentrations in the till aquifer decrease to acceptable levels.

For cost estimating purposes, it was assumed that there will be a three-year period before a final remedy is implemented. Thus, 12 rounds of sampling and analyses were considered in estimating costs.

COST ESTIMATE

An estimate of the cost of the Interim Remedy is provided in Table 1.

TABLE 1

COST ESTIMATE - INTERIM REMEDY

Probable Cost Estimate

1 -	Mobilization/demobilization	$ 150,000
2 -	Fencing: 2,400 lf x $30/lf (incl. resetting once)	72,000
3 -	Perimeter road: 3'H x 15'W x 2,400'L = 4,000 cy x $15/cy	60,000
4 -	Steel sheetpiling along creek: 600' L x 20' D x $20/sf	240,000
5 -	S/B slurry wall w/ membrane: 36,000 sf x $16/sf	576,000
6 -	Respread excavated material: incl. 25% vol. inc. - 5,000 cy x $2/cy	10,000
7 -	Foam for VOC control: 5,000 cy x $30/cy	150,000
8 -	Clearing: 6 acres x $3,000/acre	18,000
9 -	Grading: 29,000 sy x $2/sy	58,000
10 -	Geotextile cushion layer: 29,000 sy x $1.50/sy	44,000
11 -	Membrane: 60 mil HDPE - 257,000 sf x $1/sf	257,000
12 -	Cover: 12 in. fill - 9,500 cy x $15/cy	143,000
13 -	Perimeter erosion control, runoff diversion	40,000
14 -	Dewatering (from existing wells into holding tank)	130,000
15 -	Loading: 2 hrs/truck x 200 trucks x $60/hr	24,000
16 -	Transportation: 200 trucks x $550/truck	110,000
17 -	Treatment: 1,000,000 gal x $0.13/gal (Du Pont)(1)	130,000
18 -	Site security: estimated at 12,000 man-hours x $6/hr(2)	72,000
19 -	Total Construction Cost	$2,284,000
20 -	Eng'g. & Constr. Oversight(3)	500,000
21 -	Monitoring (quarterly, 3 yrs)(4)	120,000
22 -	Subtotal	2,904,000
23 -	Contingency @ approx. 10%	290,000
24 -	TOTAL COST	$3,194,000
		SAY $3.2 million

(1) On a preliminary basis, Du Pont has indicated that the FOU water would be acceptable if a two year LDR extension is granted.

(2) Assumes 6-month construction duration.

(3) As above and including design, preparation of specifications and bid packages, meetings with USEPA, and contractor negotiations and selection.

(4) Assumes 3-year period before permanent remedy is implemented, and includes 12 rounds of sampling the three on-site till wells and the on-site bedrock well, analyses for VOCs and PCBs, and water level readings of all on-site wells and piezometers.

TABLE 2

BCUA INFLUENT LIMITS[1]
(mg/l)

Metals	BCUA	Site[2]	VOCs (proposed)	BCUA	Site[2]
Arsenic	0.10	0.29	Benzene	0.85	3.48
Chromium	0.76	0.370	Chlorobenzene	10.6	3.57
Copper	2.20	0.029	Chloroethane	21.5	2.42
Mercury	0.20	0.0002	Chloroform	1.75	304.0
Nickel	0.68	0.063	1,1-Dichloroethane	19.4	3.08
Silver	0.60	0.110	1,2-Dichloroethane	4.5	221.0
Zinc	2.60	0.128	1,1-Dichloroethylene	0.14	0.40
Beryllium	NA[3]	0.001	Ethylbenzene	9.3	2.02
			Methylene Chloride	17	55.9
			1,1,2,2-Tetrachloroethane	3.85	4.40
Other Parameters					
VOCs	ND[4]	1,434	Tetrachloroethylene	1.8	16.9
PCBs	ND	4.34	Toluene	8.1	26.8
Pesticides	ND	0.017	1,2-Transdichloroethylene	17	17.1
PHC	150 (daily max)	2,270[5]	1,1,1-Trichloroethane	65	35.4
PHC	100 (monthly avg)	189	Trichloroetyhlene	3.3	72.2
TSS	350	390	Vinyl Chloride	ND[4]	3.86
BOD	350	2,270	Methyl Ethyl Ketone	NA[3]	648.0
			Xylenes	NA	13.2

(1)Provided verbally by BCUA on 14 March 1990

(2)Average concentrations (unless noted) for FOU water from Tables 1-4 and 2-1 of FS/FOU

(3)NA = not available

(4)ND = not detectable

(5)Maximum concentration in FOU water

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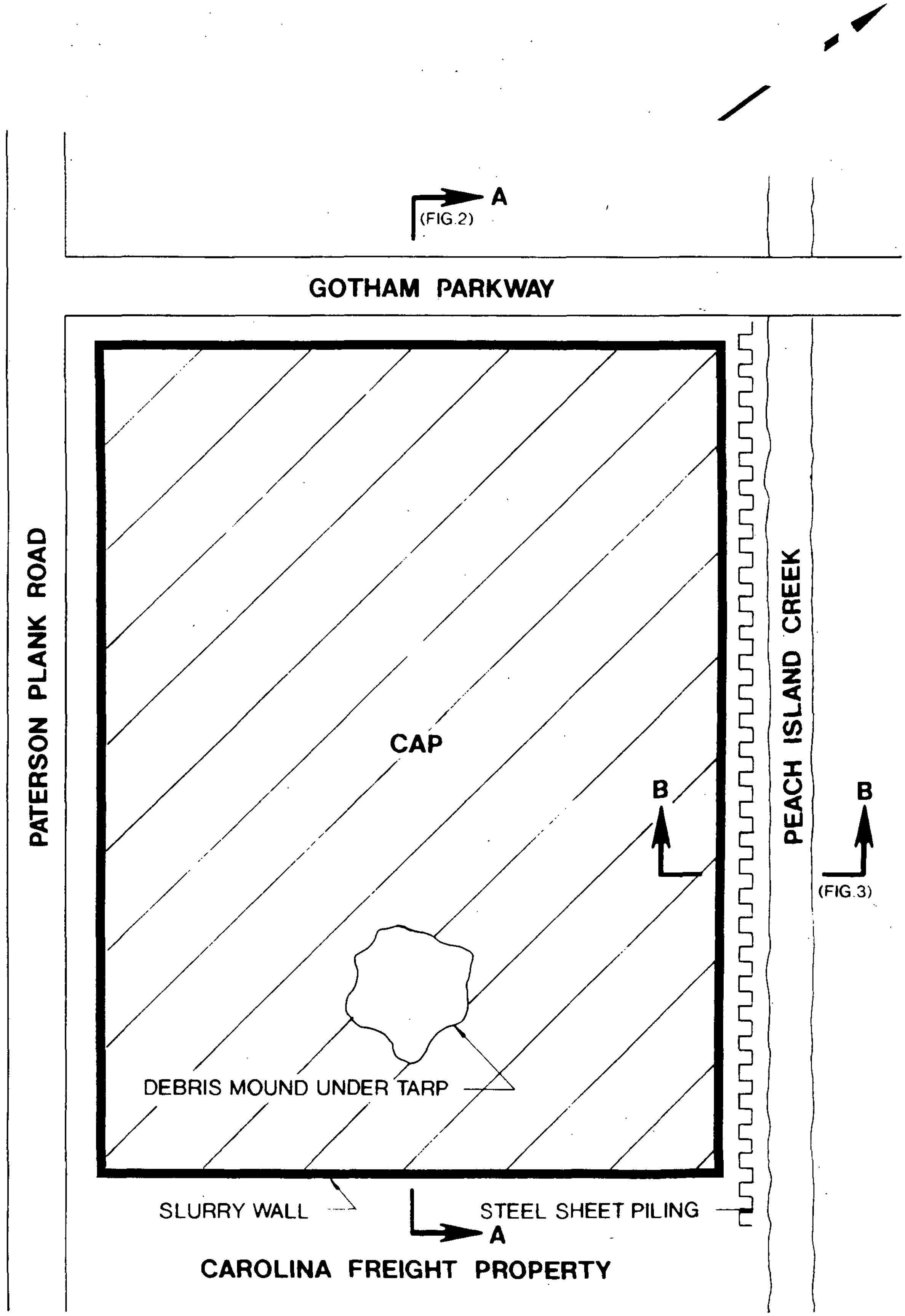

LESI Langan Environmental Services, Inc.

Elmwood Park, NJ • New York, NY • Miami, FL

SCHEMATIC PLAN – INTERIM REMEDY

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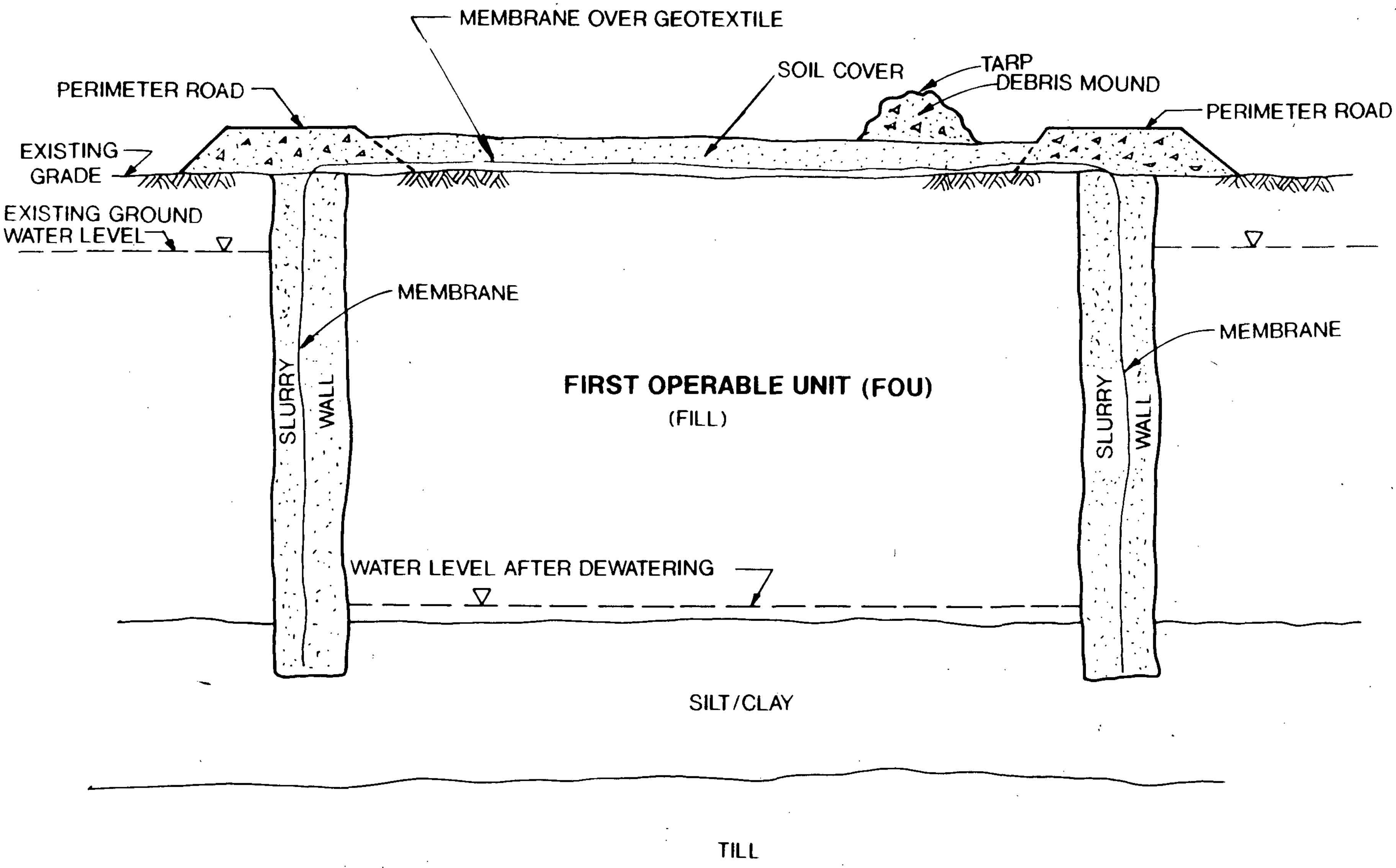
PROJ 2027001	SCALE N.T.S.	DATE 3-25-90	FIG NO 1



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SECTION A – A
INTERIM REMEDY

PROJ 2027001 | SCALE N.T.S. | DATE 3-26-90 | FIG NO 2

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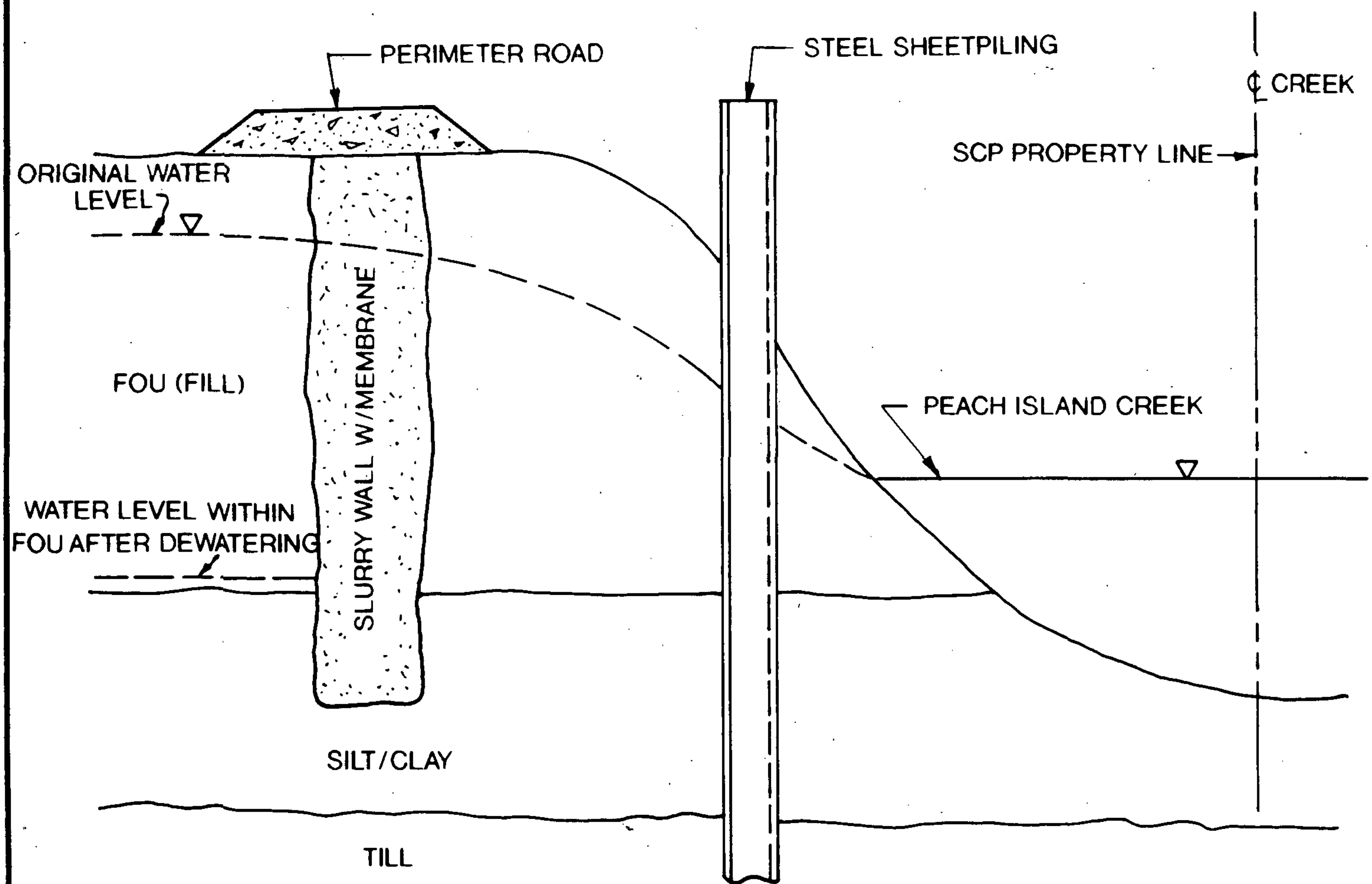

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SECTION B – B 2979

SLURRY WALL & SHEETPILING ALONG CREEK

PROJ 2027001	SCALE N.T.S.	DATE 3-26-90	FIG NO 3

002980

REV. 7-80

DU PONT

ESTABLISHED 1802

E. I. DU PONT DE NEMOURS & COMPANY
INCORPORATED
WILMINGTON, DELAWARE 19898

CHEMICALS AND PIGMENTS DEPARTMENT

March 8, 1990

Dear Customer:

On May 8, 1990, the Environmental Protection Agency (EPA) will issue a major regulation under the Resource Conservation and Recovery Act Land Disposal Restrictions ("Land Ban") Program. Under the terms of the 1984 legislation establishing the Land Ban, EPA must finalize predisposal treatment standards for hundreds of hazardous wastes by the May 8, 1990 deadline. If EPA fails to meet the deadline, the affected wastes will be banned outright from continued land disposal.

EPA issued the proposal for this major rule (known as the "Third Third Rule") in late November of 1989. Comments on the proposal were due no later than January 8, 1990. Hundreds of comments, totaling many thousands of pages, have been received. EPA must analyze, consider, and respond to these comments as part of the rule-making process.

We are writing to you now because the final Third Third Rule could adversely affect our ability to continue to treat your company's wastes at the Chambers Works facility. We have analyzed the potential effects of the rule, and have submitted extensive comments to EPA. Although EPA often changes its proposals in response to comments received, it is impossible to predict with certainty whether this will occur. We have tried to indicate the portions of the rule we believe are most likely to change. Described below are the possible worst-case impacts that the November, 1989, proposal could have on our ability to continue to treat your wastes. We are alerting you to the potential problems we face so that you can make decisions concerning your future waste management needs.

As a general note, the proposed rule emphasizes the need for all waste generators to know exactly what wastes they produce, and the physical forms and regulatory status of those wastes. The economic and regulatory penalties for incorrectly classifying hazardous wastes are already significant, and will become much more so after this rule becomes final.

POTENTIAL ADVERSE EFFECTS ON WASTES TREATED AT CHAMBERS WORKS

1. Leachate and Contaminated Groundwater

EPA has discussed two possible ways to treat leachate and contaminated groundwater. Under the first scheme, leachate and groundwater would be considered to be derived from all the hazardous wastes that go into the waste disposal area from which the leachate/groundwater is drawn. If adopted, this scheme will impose significant paperwork requirements on both generators and treaters, with no commensurate environmental improvement.

The second scheme EPA discusses would classify all hazardous waste leachates and contaminated groundwater under a single "leachate" waste code, with a consistent set of Land Ban treatment standards. This approach is considerably more workable for generators and treaters alike.

In addition to proposing the form of the standards, EPA also proposes to grant an extension of the effective date of the standards, to ensure that adequate treatment capacity of the appropriate type is available for the wastes. EPA has proposed granting a two-year extension of the May 8, 1990 deadline banning land disposal of solid and sludge residuals from treatment of leachate/groundwater. If this extension is granted in the final rule, Chambers Works will be able to continue to accept and treat hazardous waste leachates and contaminated groundwater. If the extension is not adopted in the final rule, we will not be able to accept these wastes from May 9, 1990 until approximately mid-1992.

2. **F-, K-, P-, and U-Listed Hazardous Wastes**

After May 8, 1990, Chambers Works will be able to accept the following listed waste codes for treatment (unless, as discussed above, they are in the form of leachate or contaminated groundwater):

U007—Acrylamide
U092—Dimethylamine
U113—Ethyl acrylate
U114—Auramine
U122—Formaldehyde
U123—Formic acid
U133—Hydrazine
U154—Methanol
U163—N-methyl-N^1-nitro-N-nitrosoguanidine

P022—Carbon disulfide

3. **D001 Ignitable Wastes**

For ignitable wastes (flash point below 140 degrees F), our ability to continue to treat the wastes may depend on whether they meet EPA's definitions of a "wastewater" or a "nonwastewater." EPA defines wastewaters as having less than 1 percent Total Organic Carbon (TOC) and less than 1 percent Total Suspended Solids (TSS). If either TOC or TSS is greater than 1 percent, the waste is a "nonwastewater."

Wastes that are ignitable, but that qualify as wastewaters according to the definitions above, can be accepted for treatment at Chambers Works after May 8, 1990.

The situation with respect to nonwastewaters is unclear. EPA's proposal would require that all such ignitable wastes be incinerated, burned for fuel recovery, or recycled. If EPA finalizes the November proposal, we will be unable to accept these wastes. However, we are hopeful that the Agency will modify its proposal to make it possible for highly dilute, ignitable waste-streams to be treated by biological treatment systems like the one at Chambers Works.

(Please note that for D001 and other characteristic hazardous wastes, EPA's proposed rules make it imperative that the generator correctly classify his wastes both by waste code and by "regulatory" form—that is, wastewater vs. nonwastewater. EPA has proposed requiring waste generators to supply additional classification information to treatment, storage, and disposal facilities, including a designation of the form of the waste. If you continue to send your wastes for treatment after May 8, 1990, you will likely be required to provide this information to the treatment/disposal facility.)

4. **D002 Corrosive Wastes**

Our ability to continue to treat D002 acid or alkaline corrosive wastes should not be affected by this rule.

5. **D003 Reactive Wastes**

EPA has established a number of different categories of reactive wastes. If the proposal is finalized, we will be unable to treat D003 sulfide and cyanide reactive wastes after May 8, 1990.

Our ability to continue to treat D003 explosive wastes will depend on the specific waste stream. You should consult your salesperson for further information.

6. **D004 – D017 EP Toxic Wastes**

We will be able to continue to treat the wastewater forms of all EP Toxic wastes after May 8, 1990.

Again, the situation with respect to nonwastewaters is unclear. If EPA finalizes the November proposal, we will be unable to treat D008 nonwastewaters after May 8, 1990. However, our ability to continue to treat other EP Toxic nonwastewaters depends upon how EPA classifies treatment in aggressive biological treatment systems. We suggest that you consult with your salesperson for further information on these wastes.

Because the Land Ban rules are effective as soon as they are signed, we must ensure that all wastes we receive after May 8, 1990 can be treated in accordance with the standards. We may not know what the final rule requires until it is signed and effective. Therefore, we may need to delay receipt of affected wastes for one to two weeks after May 8 to ensure that we understand and comply with the regulations. Since this could result in a short delay in scheduling receipt of your wastes, you should plan your shipments with this in mind.

We hope that this information will help you to plan and make timely decisions about your future waste management needs. We will continue to keep you informed on decisions that will affect Chambers Works' wastewater treatment capability. Our sales staff and regulatory affairs personnel will be happy to discuss these and other related issues with you in greater detail.

Sincerely,

Glenn T. Halsey
Marketing Manager
Safety and Environmental Resources

GTH:mbl